

REMARKS

The claims in this application were rejected under 35 U.S.C. 103 over Hori in view of JP'378. This rejection is respectfully traversed.

The Examiner is advised that U.S. 6,243,254 ("Wada") corresponds to the Japanese reference. A copy of the U.S. patent is enclosed herewith for the convenience of the Examiner and since it is in English, it will be referred to hereinafter in discussing the rejection.

The present invention relates to a dielectric ceramic composition in which there is a combination of a barium calcium titanate, and manganese, copper, silicon and rare earth oxides in particular molar amounts and in which the ratio of barium to calcium falls within a particular range and the cation of the titanate is also within a particular range.

The miniaturization of laminated ceramic capacitors has accelerated over the last several years. To meet the miniaturization requirement, the thickness of the dielectric ceramic layers has gradually decreased but as this occurs, the field strength imposed on the dielectric has increased resulting in significant reductions in insulation resistance, dielectric strength and reliability. This resulting in the necessity of reducing the rated voltage to an extent depending on the thickness of the dielectric layer.

The dielectric of the present invention as well as those of the references cited are designed to avoid the reductions and insulation resistance, dielectric strength and reliability under the high field strength which is imposed on the dielectric when the thickness of the layer is reduced. However, the formulation necessary to achieve this objective when the thickness is one value does not carry forward *ipso facto* to what is necessary at another thickness. This fact is significant because the present invention is

designed to realize the objective which the dielectric layer thickness is about 1 micron. The dielectrics of the references, on the other hand, were designed for use when the field strength was not as high as it is in the present invention -- Hori was for dielectrics used at a thickness of 5 μm (column 6, lines 14-15) and Wada at a field strength when the thickness was 3 μm (column 7, lines 53-55).

The Hori patent relates to a dielectric ceramic composition represented by $100\text{Ba}_m\text{TiO}_3 + a\text{RO}_{3/2} + b\text{CaO} + c\text{SiO}_2$ which may also contain a further secondary constituent including a compound containing at least one element selected from the group consisting of Mn, Zn, Ni, Co and Cu. In order to obtain the desired dielectric characteristics, the titanate must be barium titanate and not barium strontium titanate or some other titanate and the molar relationships set forth in the patent must be satisfied. The assertion in the Office Action that Hori discloses the claimed invention except for the main component being a particular barium calcium titanate is thus an overstatement of the teachings of this reference. Simplification of a reference for description purposes cannot be allowed to cross the line where it becomes a modification of that reference's disclosure. *Medtronic, Inc. v. Cardiac Pacemakers, Inc.*, 220 USPQ 97 (Fed. Cir. 1983). This reference teaches the possible presence of a copper oxide only when the titanate is barium titanate.

The Wada reference relates to a dielectric ceramic composition represented by the formula at column 2, line 19 which must also contain a $\text{Li}_2\text{O}-(\text{Si},\text{Ti})\text{O}_2$ -MO based oxide or an SiO_2 - TiO_2 -XO based oxide, provided that the molar ratios set forth therein are observed. There is not teaching or suggestion that a copper oxide can be present. While the Office Action asserts that substituting a barium calcium titanate in the ceramic material of Hori was obvious "since such a modification would form a ceramic composition having high insulting resistance, and anti reduction property", there is no

such teaching in Wada and this is clearly an attempt at an after-the-fact justification for the substitution. [A] retrospective conclusion that an unstated advantage would follow from the suggested combinations is not a substitute teaching or suggestion which supports the selection and use of the various elements in the particular claimed combination. *In re Newell*, 13 USPQ2d 1248 (Fed. Cir. 1989). Wada teaches that in order for the barium calcium titanate based ceramic to be used, at least one of the subcomponents must be present but neither is present in Hori. Nothing in the Wada reference would lead one skilled in the art to believe that the barium calcium titanate of Wada could be simply extracted from that reference and substituted for the titanate in Hori and expect satisfactory results. Simply extracting the barium calcium titanate from Wada does not necessarily mean that a titanate within the scope of the instant claims can be realized. For example, the molar amount of Ca in Wada can be 0.22 whereas the instant claims call for an amount which is up to 0.2. Similarly, the (BaCa) ratio to the titanate anion in Wada can be up to 1.035 whereas it is only up to 1.030 in the present invention. In other words, not only does the theory of the rejection require extraction of a barium calcium titanate from Wada, but it also requires a selection from among the various barium calcium titanates disclosed in that reference.

Hori requires the titanate to be barium titanate if any copper oxide is present. Wada requires 2 particular secondary materials to be present if the titanate is barium calcium titanate. Since references cannot be combined if the effect would destroy the invention on which one of the reference patents is based, *In re Hartmann*, 186 UPQ 366 (Bd. App. 1974), the combination of Hori and Wada is improper.


The data in the present invention shows that under a high field strength which exists when the thickness of the dielectric ceramic layer is 1 μ m, a synergistic effect is achieved when there is a combination of (Ba_{1-x}Ca_x)TiO₃, CuO and Re₂O₃ and

the values of s, m, b and c fall within the ranges specified in the claims. If any of these values is not present, then the mean failure time of the laminated ceramic capacitors unfavorably decrease. See, e.g., Samples 1, 4, 7 and 11 in the present application. In Sample 1, the value of x is greater than 0.20 (which Wada permits), in Sample 4 the value of m is greater than 1.030 (which Wada permits), in Sample 7, the amount of copper oxide (b) is less than 0.05 (which Hori allows) and in Sample 11, the content of the rare earth oxide is less than 0.05 (which Hori allows). The fact that the claimed composition has unobvious properties cannot be denied.

In light of all of the foregoing, it is respectfully submitted that the rejection based on §103 should be withdrawn.

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Respectfully submitted,

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